

# CHILD JUSTICE

DNA CAN  
FREE THE INNOCENT  
AND NAIL  
THE GUILTY. BUT  
IT COULD  
ALSO SUBVERT OUR  
LEGAL SYSTEM.

**BY MARK  
SCHOOFS**

**AT 2:10 IN THE MORNING OF**  
September 30, 1979, Kevin Lee Green  
came home from getting a  
late-night burger and "found my wife  
lying face up on the bed, all bloody,  
with a hole in her head."  
She was pregnant and two months past  
due, so Green kept wondering,  
"If she dies right here, what am  
I going to do about the baby?"  
Ten hours later, "I was watching two  
different heart monitors, one  
for the baby and one for her, and the  
baby's just stopped."  
Green's wife pulled through, but  
she had lasting brain damage.  
Indeed, she didn't recall anything about  
the attack for two months.  
Then she suddenly remembered her  
assailant: Green himself.  
On the strength of his wife's recovered  
memory, Green was convicted  
and sent to prison. →



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## SCHOOLS

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After all his appeals were exhausted, Green's parole board made it clear that if he confessed he would be set free. Green might have given in if he had not been rescued by a new forensic tool: vast computerized DNA data banks of convicted criminals.

Spurred by the new genetic data banks, police last year reexamined biological evidence from a series of unsolved homicidal rapes in the L.A. suburb where Green had lived. A DNA computer check led them to a convicted rapist named Gerald Parker, who said he felt bad that another guy was doing time for one of his crimes—attacking a pregnant woman.

Green's case had been closed, yet "by God's intervention," some of the evidence was still in storage. "They tested the bedsheet," he recalls, "and bang! There was Parker's DNA."

After 16 years in jail, Green heard a judge bang his gavel and say, "You may leave by any door you wish."

**MORE THAN 40 PEOPLE** have been freed from jail by DNA. But postconviction appeals are extremely difficult to win, so that number only hints at the power of genetic evidence. A better measure is pretrial exonerations: Since 1989, the FBI has found that DNA testing clears about one quarter of its sexual-assault suspects, or about 2000 people each year. Without DNA, asks Mitchell Holland, director of the military's forensic DNA laboratory, "how many of those folks would have gone to jail?" [See sidebar, "No Appeal."]

Coiled in almost every human cell and easily shed at crime scenes, DNA has become the most powerful tool of forensic science, absolving the innocent and identifying the guilty. If two DNA samples don't match, they definitely do not come from the same person. If they do match, there's only a tiny chance that they come from different people.

Statisticians still debate the odds that two people could have the same DNA fingerprint. That has led to different legal standards in different jurisdictions. But this dispute rages over very small probabilities. "The odds are always one in the hundreds of thousands or millions, not one in five," says Mechthild Prinz, a forensic scientist in the New York City medical examiner's office. Of course, DNA can also be undermined by sloppy lab practices, and many experts feel that better safeguards are needed. [See sidebar, "The Finger of God?"]

These technical concerns are important, but the most profound questions center on how this powerful technology will be used.

Three years ago, fewer than half the states had passed legislation authorizing DNA collection; now nearly all have. Whose DNA do they take? All states take samples from convicted rapists. Virginia takes samples from all convicted felons, violent or otherwise. Until this summer, South Dakota allowed DNA to be taken and stored from people who had not been convicted, merely arrested.

This alarms civil libertarians. Indeed, even as DNA data banks are nabbing the guilty and clearing the innocent, many fear they will create an Orwellian nightmare.

Already, Great Britain, Germany, and other democracies have conducted DNA dragnets. In searching for a rapist, English police asked every man in a small town to give blood for DNA typing. More than 5000 men "volunteered," but they had all been notified that refusing to give blood would place them under suspicion. This action led to the arrest of the rapist, and its success could pave the way for the tactic to be used again.

The U.S. Constitution prohibits "unreasonable searches and seizures," which most legal experts believe would preclude DNA dragnets. Still, civil libertarians fear a "surveillance creep." Writing in the prestigious *American Journal of Human Genetics*, law professor Jean McEwen and clinical geneticist Philip Reilly note that most states allow use of DNA samples for "law enforcement" purposes. But they ask, "What exactly is 'law enforcement'?" Does it encompass immigration authorities, child-support enforcement officials, or other state agencies, which may someday all be connected through massive interlocking computer networks?"

At first, DNA data-banking laws were "narrowly directed at repeat sex offenders," note McEwen and Reilly. But those laws "are increasingly being broadened." Indeed, in 1991, the FBI recommended against collecting DNA samples from people who commit misdemeanors—but more and more states are disregarding that advice.

In Arkansas, a 16-year-old boy who has sex with his 13-and-a-half-year-old girlfriend has broken the law, and he can now have his DNA put on file. In Massachusetts "possession or dissemination of obscene material" is grounds for storing DNA. Arizona allows

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## no appeal

HOW MANY PEOPLE GO TO JAIL for crimes they didn't commit? A Justice Department report published last year sheds light on that question. *Convicted by Juries, Exonerated by Science* analyzes 28 cases in which people were sent to prison and subsequently cleared by DNA. One of the convicts faced execution.

Virtually all of those cases involve rape, the crime for which DNA is most often available, for the simple reason that rapists often ejaculate. Indeed, DNA clears about a quarter of all sexual-assault suspects before trial. If genetic evidence were equally available in other crimes, say attorneys Barry Scheck and Peter Neufeld, a similar proportion of suspects would also be absolved.

Whatever the causes of injustice, the appeals system is supposed to rectify them. In more than half

the cases examined in the DOJ report, defendants did appeal before DNA proved their innocence. In one case, another person confessed to the crime; in another, the victim admitted fabricating her allegation of rape. Shockingly, these appeals were denied. Until DNA came to the rescue, the innocent remained in prison, and the guilty eluded justice.

Appealing a conviction has never been easy. But Congress recently passed an antiterrorism law that severely limits appeals, and the Supreme Court has also restricted this right. Just as DNA testing "demonstrates that the problem of wrongful convictions in America is systemic and serious," write Scheck and Neufeld, the government has "eviscerated" the hopes of those wrongly condemned to jail or death.

—M.S.

# SCHOOLS

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DNA to be taken for "sodomy"—homosexual or heterosexual.

"We're going to expand our DNA database" to include "peeping Toms, public exposure, that kind of thing," says Carlos Rabren, director of Alabama's forensic science department. Rabren thinks "that's reasonable" because the mere act of putting people's DNA on file might "discourage them from criminal misconduct." Besides, he adds, the state's right to keep DNA is "no different than fingerprints."

But fingerprints can't predict disease or determine paternity. DNA can do both, which is why civil libertarians are apprehensive. They have two fears: misuse of the DNA archives the government is collecting to nab criminals, and police access to the proliferating DNA archives in hospitals, universities, and biotech companies.

Indeed, if the Clinton administration has its way, the medical records of every American—with or without a criminal record—would be open to any law enforcement or intelligence agency, which could include everything from the CIA to the departments of Treasury, Energy, and Defense. Officers from such agencies would not need to obtain a warrant, or even to notify patients beforehand.

With such unlimited access, what could be found? Thousands of Americans have been tested for mutations of a gene called APOE. Certain variations of that gene can predispose a person to heart disease. But recently, mutations of this same gene have been linked to Alzheimer's. People who thought they were being tested for one condition suddenly have information in their medical records about an entirely different condition. This is a precursor of things to come, say many geneticists, because most genes have multiple effects.

In the past, the government has misused genetic information. Sickle-cell anemia is a blood disorder that occurs only in people who inherit two copies of a mutated gene, one from each parent. People who carry only one copy of the gene suffer no problems. But in the 1970s, the Department of Defense barred all people with one copy of the gene from attending the Air Force Academy, effectively limiting their advancement to top posts. In his book *The Lives To Come*, U.C. San Diego professor Philip Kitcher notes that the official rationale—put forth without scientific proof—was that carriers of the gene "are at risk of collapsing at high altitudes." But many critics smelled racism, because the sickle-cell gene is most common among African Americans. Only a lawsuit, bolstered by decades of research, ended the ban.

**THE GOVERNMENT'S OWN** criminal DNA data banks spark different fears. For criminal identification, geneticists don't analyze the entire DNA molecule, just a few segments that vary among individuals. Once that analysis is complete, the actual DNA is no longer needed, only the computerized record. Indeed, the National Academy of Sciences recommends that DNA samples be destroyed "promptly" after they are logged into a computer.

But no state does this. On the contrary, they all keep the actual DNA. That worries Pamela Sankar, a bioethicist at the University of Pennsylvania. She points out that during the 1930s FBI director J. Edgar Hoover tried to acquire the military's fingerprint files. The Navy and Marines resisted—until "national security fears during World War II made continued opposition too costly, and all branches capitulated. The lesson here is an easy one. Guarantees made under one set of political conditions are not necessarily honored under other political conditions."

How could the DNA banks be used? Prominent New York attorney Barry Scheck, an expert on DNA legislation, says that under many state laws forensic data banks could be opened "to conduct 'law enforcement' studies

on the genetic makeup of sex offenders, drug addicts, alcoholics, or violent offenders generally." Such research could mark a perilous step toward a society in which carriers of "criminal genes"—whether or not they have violated the law—are monitored, controlled, or perhaps even genetically "cured."

Genetic research into crime has often been a fig leaf for bigotry. American scientists in the 1920s and '30s asserted that Southern Europeans and blacks are genetically inclined to crime, and some contemporary researchers make similar claims about African Americans. In fact, a "criminal gene" will never be found, because crime encompasses too wide a range of behavior—from insider trading to rape—and because the very concept is socially defined. Until this century, duels were an accepted way to settle disputes; today they are considered manslaughter.

But even apparently sound genetics can go terribly awry. In the 1960s, British researchers noticed that male prisoners and mental hospital patients carried an extra Y chromosome at higher rates than men in the general population. Most men have one X and one Y chromosome, so the condition was called the XYY anomaly. Scientists speculated that the extra male chromosome predisposes people to violence and aggression.

That conjecture was later debunked. But in his history of the dark side of genetics, *In the Name of Eugenics*, Caltech professor Daniel Kevles describes the initial reaction to the "criminal chromosome": "Various scientists, legal scholars, and public officials argued that XYY males were almost certainly prone to criminal violence, and suggested that they be identified through screening programs and kept under scrutiny." Harvard biologist Ruth Hubbard has noted that researchers were set to screen all boys born at a Boston hospital, and to monitor those who were XYY at home and in school for any "abnormalities." The study was scuttled, partly because other scientists objected that the very act of observing these children could harm their development.

Alabama, the first state to reintroduce chain gangs, is also the only one that explicitly authorizes its criminal DNA banks to be used for medical and other research. Rabren, who helped write the law, says the purpose is "to benefit mankind," and notes that the law forbids studies that would allow individuals to be identified. That provision, he says, makes it unlikely that the DNA banks ever would be used for research, because geneticists today seek to obtain family histories, which would abrogate the confidentiality clause.

Still, what if scientists wanted to search for a gene linked to crime? "Right now," he responds, "I wouldn't approve of such research." But if a genetic-research proposal were approved by "all the ethicists," then, he says, "I'm not sure we have a problem here. What would be ethically wrong if we could find a criminal gene and impose a fix? Perhaps these people's greatest fear is our greatest hope."

**BEHAVIORAL GENETICS** WILL almost certainly reveal tendencies and predispositions, some of which might correlate with crime. As with the XYY study, such findings will almost certainly incite calls to monitor the carriers of such genes and could lead to a new kind of risk assessment, an actuarial table for crime.

Indeed, crime could be redefined as a public-health threat, warn Dorothy Nelkin and M. Susan Lindee in their book *The DNA Mystique*. "As in the case of epidemics," they caution, "individual rights must be suspended to preserve public order. Reinforced by popular belief in the deterministic powers of the gene, genetic information could open opportunities for social control of unprecedented power as predispositions are employed to predict and avoid potential risk." The result: "People with

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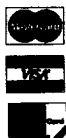
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## SCHOOLS

CONTINUED FROM PAGE 49  
problems become, in effect, problem people."

There is ample precedent for this approach. In the 1920s and '30s, crime and mental illness were assumed to have a genetic basis, and tens of thousands of "feeble-minded" patients were forcibly sterilized for the greater good. This went on, in the United States, Sweden, and other democracies, until the 1970s. Some researchers still support the basic concept of purifying the gene pool. This year, Byron Roth, a psychology professor at Dowling College, wrote that "imprisonment has eugenic effects in preventing reproduction by those deemed socially undesirable." As medical genetics advances, "fixing" supposedly criminal genes might seem humane compared to incarceration, abortion, or sterilization.

But there's a catch: a gene for, say, aggression might correlate with crime and with desirable outcomes, such as success in business or athletics. This raises a fundamental question: what exactly is a genetic "predisposition"?

Certainly not destiny. University of Minnesota psychologist Thomas Bouchard champions the influence of DNA on human behavior, but even he says flatly that behavior is "never 100 per cent genes." This is proven by his own

studies of identical twins, who have exactly the same DNA but are never exactly alike. In the most dramatic case, one twin was raised as a Jew while the other was raised as a Nazi and joined the Hitler Youth. Environment matters.

A genetic explanation of crime trivializes politics, allowing society to overlook poverty, lack of education, and all the other social incubators of crime. Moreover, it subverts individual responsibility. Everything we have learned about genes and behavior demonstrates that DNA cannot predict what an individual will do. In criminal justice, therefore, a genetic "predisposition" is merely prejudice—a judgment in advance. And it's a particularly pernicious bias because it reverses the fundamental principle of American justice, the presumption of innocence.

Ultimately, a genetic explanation of crime reduces human beings to a single molecule: DNA. But the way genes culminate in a person depends on everything from diet to parental love. Whatever human consciousness is, it is clearly more than DNA—and any legal system that denies this is not only bad justice but bad science. **V**

Part Five: The End of Nature

Research assistance: Mina Seetharaman and Catherine Donaldson-Evans

## the finger of god?

"DNA IS AS ACCURATE AS THE FINGER OF God," says Jeanine Pirro, district attorney for Westchester County.

That's apparently what the jury believed in the 1993 trial of Timothy Durham. Eleven eyewitnesses testified that Durham was in Dallas when the prosecution said he was in Tulsa, raping an 11-year-old girl. But that cavalcade of witnesses couldn't raise a reasonable doubt. Instead, three pieces of evidence sent Durham to the slammer with a 3120-year sentence: the child's eyewitness account, hair from the crime scene that was similar to Durham's, and DNA.

But Durham was not guilty.

Forensic genetics works by comparing different segments—called loci—of DNA that are known to vary among individuals. If the same locus from two different samples of DNA are the same length, or have the same distinguishing motif, then they are said to "match." The more loci that match, the more likely that the DNA samples came from the same person. But if even one locus differs, then the samples are from different people. In the Durham case, prosecutors tested just one locus, which did indeed match. But when more loci were analyzed, they proved that the rapist's semen did not come from Durham.

DNA is really "the finger of a group of lab technicians who are all too human, with all too many biases," says William Thompson, a professor of criminology, law, and society at UC Irvine. He argues that cases like Timothy Durham's will happen again because forensic science is neglecting basic safeguards.

**LABS MUST BE EXTREMELY CAREFUL**, because DNA tests are ultrasensitive. The tests require special chemicals, and "it's not uncommon for the DNA of the people who manufactured the chemicals to show up in the final results," says Syracuse Univer-

sity geneticist William Shields.

It is impossible to know how common laboratory errors are—but there are disturbing signs. New York is the only state that requires forensic laboratories to be accredited. But labs everywhere are seeking this seal of approval so their evidence will carry more weight in court. Labs know when inspectors will arrive and what they will look for. Even so, says Ralph Keaton, executive secretary of the crime lab accreditation board, about 90 per cent of labs "have needed time after the first inspection" to pass muster.

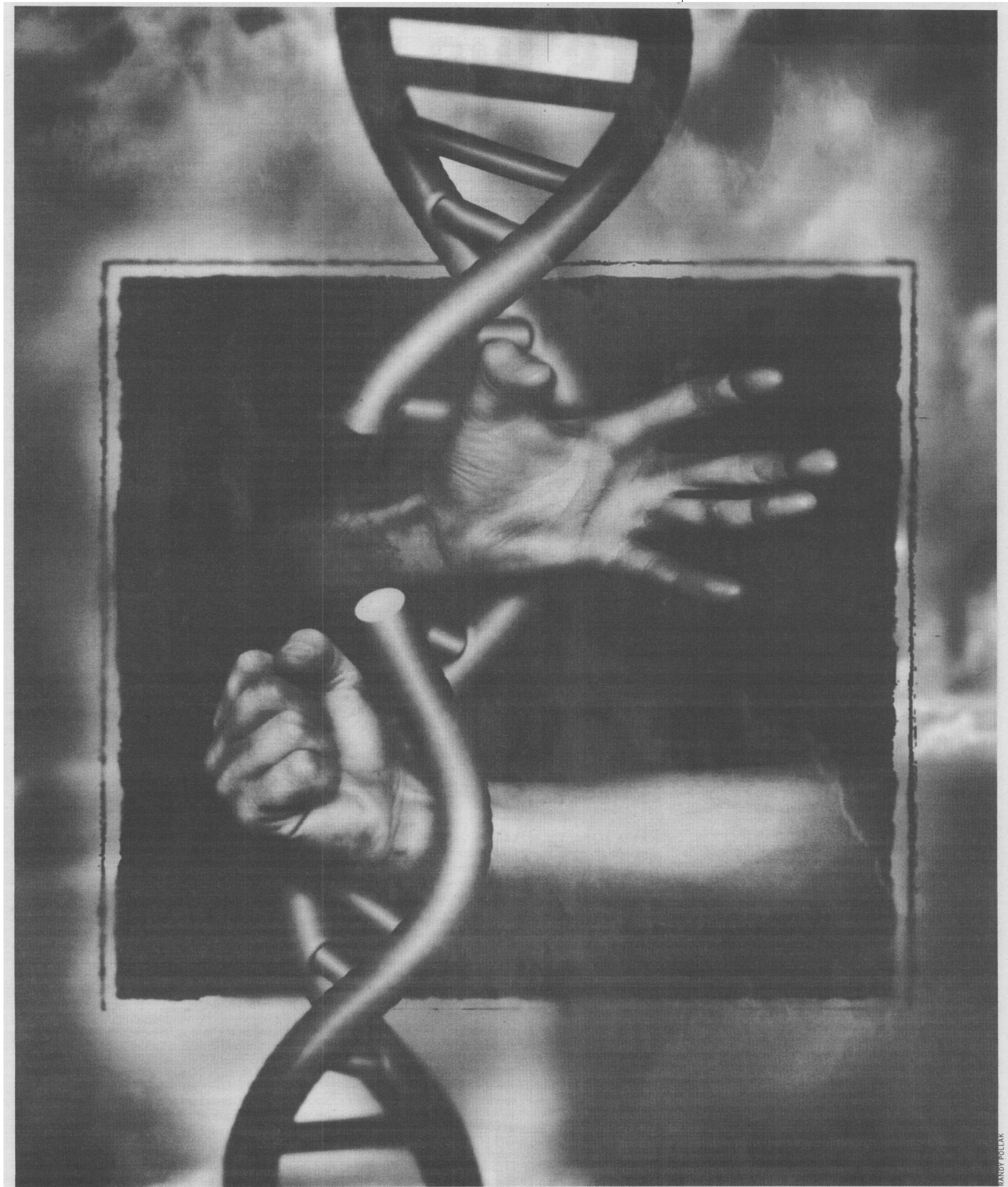
Nevertheless, forensic DNA analysis is generally done only once, instead of being replicated at separate labs. This is a major reason Thompson thinks "forensic science is not a science," for replication is fundamental to the scientific method.

The lack of replication might be solved by retesting, but that right is not guaranteed to defendants in all jurisdictions. What's more, ace DNA attorneys Barry Scheck and Peter Neufeld conducted an informal telephone survey, finding that in fewer than 5 per cent of cases did the defense contact a DNA expert, let alone ask for a retest.

Thompson would require duplicate testing in separate labs whenever there is a large enough evidence sample to do so. That might minimize the biases that skew forensic science away from objectivity. The field, Thompson notes, "is dominated by experts and laboratories whose primary clients are law enforcement agencies, and whose typical role in litigation is to provide evidence in support of criminal prosecutions."

"Most of the time DNA evidence is reliable and incredibly valuable," says Thompson. "But the way it's being used is just cavalier. It's the scientific equivalent of the Wild West." **—M.S**





RANDY POLLAK